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757 7590 09/14/2010  
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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT

PAPER NUMBER

1716

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/786,914	<b>Applicant(s)</b> NAKANO ET AL.	
	<b>Examiner</b> Luz L. Alejandro	<b>Art Unit</b> 1716	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                     |                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                         | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Reissue Applications***

Claims 1-23 are rejected under 35 U.S.C. 251 as being based upon new matter added to the patent for which reissue is sought. The added material which is not supported by the prior patent is as follows:

In claim 1-lines 13-15, claim 13-lines 17-20, and claim 23-lines 20-23, the specification, as originally filed, does not provide support for the limitation of “the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a susceptor impedance less than  $15\Omega$  using a power source having frequency higher than 13.56 MHz”.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification, as originally filed, does not provide support for “so that the plasma treatment equipment have a susceptor impedance less than  $15\Omega$  using a power source having frequency higher than 13.56

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MHz” in the newly added limitation of “the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a suscepter impedance less than  $15\Omega$  using a power source having frequency higher than 13.56 MHz”, as required by newly amended claim 1-lines 13-15, claim 13-lines 17-20, and claim 23-lines 20-23.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation of “ the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a suscepter impedance less than  $15\Omega$  using a power source having frequency higher than 13.56 MHz” in claim 1-lines 13-15, claim 13-lines 17-20, and claim 23-lines 20-23, is not clear since it is not understood how the metal plates are configured to achieve the claimed suscepter impedance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-23 are rejected under 35 U.S.C. 103(a) as being obvious over the Admitted Prior Art (APA) in view of Kawakami et al., JP 06-333879 or Sakai et al., JP 10-032171 or Kagatsume et al., US 4,908,095.

APA shows the invention substantially as claimed including a plasma treatment equipment having a chamber 60 for performing plasma treatment, the chamber having a bottom wall and a side wall 10, the plasma treatment equipment comprising: a plasma excitation electrode 4 to which a power for plasma excitation is supplied, the plasma excitation electrode being provided in the chamber; and a susceptor electrode 8 that is opposed to the plasma excitation electrode provided in the chamber; the susceptor electrode being an electrode into which a high frequency electric current based on the power for plasma excitation flows after passing through a plasma space; the susceptor electrode disposed within the plasma chamber and comprising a generally planar

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shaped electrode portion oriented substantially parallel to the bottom wall of the plasma chamber and further comprising a generally planar shaped shield 12 disposed adjacent to the electrode portion, the shield being located between the electrode portion and the bottom wall of the plasma chamber; the susceptor electrode and the shield of the susceptor electrode have the same DC potential as that of a chamber wall 10 of the chamber, wherein the susceptor electrode is connected to the chamber wall 10 of the chamber by a bellows 11 provided in the chamber (see, for example, figs. 12-16, and their descriptions).

APA does not expressly disclose that the chamber wall of the chamber and the susceptor electrode/shield are AC shorted to each other by a plurality of metal plates. Kawakami et al. discloses a plasma treatment equipment comprising: a plasma chamber wall, a susceptor electrode 8 disposed within the plasma chamber and comprising a shield 12 disposed adjacent to the electrode portion; and wherein the bottom wall of the plasma chamber and the susceptor electrode/shield are AC shorted to each other by a plurality of metal elements 14 at a plurality of short points of the chamber wall which are disposed approximately symmetrically with respect to a center of the shield of the susceptor electrode (see, for example, figs 1-6 and their descriptions). Additionally, Sakai et al. discloses a plasma treatment equipment comprising: a plasma chamber wall; a susceptor electrode (1/1a, 1b, 11 ) disposed within the plasma, wherein the bottom wall of the plasma chamber and the susceptor electrode are AC shorted to each other by a plurality of metal elements 12 at a plurality of short points of the chamber wall which are disposed approximately symmetrically with

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respect to a center of the susceptor electrode (see, for example, figs. 6-10 and their descriptions). Furthermore, Kagatsume et al. discloses a plasma treatment equipment comprising: a plasma chamber wall; a susceptor electrode 20 disposed within the plasma, wherein the bottom wall of the plasma chamber and the susceptor electrode are AC shorted to each other by a plurality of metal elements 27 at a plurality of short points of the chamber wall which are disposed approximately symmetrically with respect to a center of the susceptor electrode (see, for example, fig. 5 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of the APA as to further comprise a plurality of metal plates connected between the susceptor electrode/shield and the chamber wall in order to AC short the susceptor electrode/shield and the chamber wall from each other and thereby optimize the apparatus and the processes performed within by effectively preventing discharge abnormalities and external noises.

Additionally, note that in the apparatus of the admitted prior art modified by Kawakami et al. or Sakai et al. or Kagatsume et al., the plurality of metal elements will pass high frequency current as claimed. Moreover, regarding the metal elements being metal plates, a prima facie case of obviousness exists because the particular shape of the metal elements is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed metal element is significant.

With respect to the plurality of metal plates being configured to pass high frequency current so that the plasma treatment equipment have a susceptor impedance

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less than  $15\Omega$  using a power source having frequency higher than 13.56 MHz, it should be noted that the apparatus of the admitted prior art modified by Kawakami et al. or Sakai et al. or Kagatsume et al. is capable of being configured so that the susceptor have the claimed impedance. It should be noted that the susceptor impedance of the plasma treatment equipment depends upon a variety of factors including, but not limited to, the frequency of the power supplied to the electrode, the frequency of the power supplied to the susceptor electrode, the material of the substrate being processed, the size of the substrate being processed, among others. Therefore, the apparatus of the admitted prior art modified by Kawakami et al. or Sakai et al. or Kagatsume et al. is capable of being used/configured so that the plasma treatment equipment have a susceptor impedance less than  $15\Omega$ .

Furthermore and with respect to claims 2-5, 11-12, 15-16 and 20-22, APA, Kawakami et al., Sakai et al. and Kagatsume et al. do not expressly disclose that the susceptor electrode and the chamber wall are shorted at a location shorter than 500 mm from a side wall of the chamber wall, and an angle formed between the metal plate and the bottom wall is less than 45 degrees. Concerning the shorting location and the angle between the metal plate and the bottom wall, a prima facie case of obviousness still exists because where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device absent the showing of unexpected results.



***Response to Arguments***

Applicant's arguments filed 8/24/10 have been fully considered but they are not persuasive. Applicant argues that none of the references disclose the newly added limitation to the independent claims of "the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a susceptor impedance less than  $15\Omega$  using a power source having frequency higher than 13.56 MHz" since the cited references do not disclose metal plates for shorting the chamber wall and the susceptor electrode. First, note that the language of the newly added limitation fails to comply with the written description requirement and renders the claims indefinite, as stated in the above and respective 35 USC 112, first and second paragraph rejections. Applicant states that support for the newly added limitation may be found in Fig. 4B and col. 7, lines 16-39. However, the examiner respectfully disagrees because neither Fig. 4B nor col. 7, lines 16-39 of the specification disclose the newly added limitation. It should be noted that Fig. 4B appears to only provide support for the power source having a frequency of 40.68 MHz or having a frequency of 60 MHz. Additionally, fig. 4B shows that another parameter/factor (not claimed) is also related to the susceptor impedance. However, fig. 4B and the specification are not clear with respect to the parameter in the horizontal axis of fig. 4B, and therefore, it is unclear what this parameter represents. Furthermore, the examiner respectfully disagrees with applicant's argument because the apparatus of the admitted prior art modified by Kawakami et al. or Sakai et al. or Kagatsume et al. is capable of being configured so that the susceptor have the claimed impedance. It should be noted that

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the susceptor impedance of the plasma treatment equipment depends upon a variety of factors including, but not limited to, the frequency of the power supplied to the electrode, the frequency of the power supplied to the susceptor electrode, the material of the substrate being processed, the size of the substrate being processed, among others. Therefore, the apparatus of the admitted prior art modified by Kawakami et al. or Sakai et al. or Kagatsume et al. is capable of being used/configured so that the plasma treatment equipment have a susceptor impedance less than  $15\Omega$ .

Regarding the metal elements being metal plates, a prima facie case of obviousness exists because the particular shape of the metal elements is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed metal element is significant. Note that arguments of counsel cannot take the place of evidence in the record. Additionally, the examiner respectfully contends that the specification of the instant application, in col. 6-line 25, appears to disclose that the metal plates (not the ends) are elastic springs. Therefore, the shape of the bellows of Kawakami et al. and Kagatsume et al. and especially the coils disclosed by the Sakai et al. references, respectively, would not result in a structure with the opposite effect of Applicant's claimed structure. Even more, the coils of the Sakai et al. reference would have a similar shape as the elastic rings disclosed by the applicant in the specification.

Therefore, for at least these reasons, the 35 USC 103 rejection of the claims using the Kawakami et al., Sakai et al. and Kagatsume et al. references are respectfully maintained.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Luz L. Alejandro/  
Primary Examiner, Art Unit 1716

September 10, 2010